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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
KHUONG, LEE T	

ART UNIT	PAPER NUMBER
2665	

DATE MAILED: 04/12/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/924,278	AHN ET AL.	
	Examiner	Art Unit	
	Lee Khuong	2665	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *07 August 2001*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-49* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-49* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

3. Claims 1, 9, 12, 22, 32, 40 and 48 are rejected under 35 U.S.C. 103(a) as being unpatentable over Maurya (US 6,160,808) in view of Matthews et al (US 6,084,858) hereinafter is referred as Matthews.

Regarding claims 1 and 40, Maurya teaches a Technique For Transmitting Incoming Multi-Link Point-To-Point (PPP) Packet Traffic Over Multiple Outgoing Links In A Multi-Link Bundle. Maurya teaches a system comprising:

a transmitter (605, Fig. 6A, ***a transmitting client PC***) to send data frames over a multilink data connection (see col. 12, lines 11-16);

a receiver (650, Fig. 6A, ***a receiving server***) to receive data frames over the multilink data connection (see col. 11, lines 34-39 and col. 12, lines 32-65, ***a terminal adapter 660 receives packets having sequence numbers that increment by a value n***).

Maurya does not expressly teach a set of individual links of the multi-link is given a credit value based on speed of data transmission and current level of data traffic for each link.

Matthews teaches assigning a metric Z value to each individual link/path based on speed of data transmission and current level of data traffic for each link/path (step 16, Fig. 2A, see col. 4, lines 44-49, ***a metric Z value is assigned to each individual link based on transmission criteria***).

At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to combine the distribution of communication load over multiple paths based on link utilization of Matthews with the Transmitting Incoming Multi-Link PPP Packet Traffic of Maurya to arrive the invention in claims 1 and 40.

One of ordinary skill in the art would have been motivated to do this in order to improve network efficiency (see col. 3, lines 36-45).

Regarding claim 9, 12, 22, 32 and 48, Maurya and Matthews teach all limitations set forth in the rejections of claims 1, 10, 20, 30 and 40. Matthews does not expressly teach a data frame is sent over the link with the credit value that is largest.

Matthews does teach a data frame is sent over the link with the credit value (***metric Z value***) that is lowest with highest available bandwidth and increase the metric Z value as bandwidth is used (see col. 4, lines 50-57) similar to applicant's invention as selecting the link with the largest credit value and reducing the credit value as bandwidth is use. In both inventions, they are designed to determine the current available bandwidth of a link.

At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to modify Matthews' invention from selecting the link with the largest credit values as design choices.

One of ordinary skill in the art would have been motivated to do this in order to improve network efficiency (see col. 3, lines 36-45).

4. Claims 2-8, 10-11, 13-21, 23-31, 33-39, 41-47 and 49 are rejected under 35 U.S.C. 103(a) as being unpatentable over Maurya (US 6,160,808) in view of Matthews and further in view of Chiussi et al. (US 6,608,813) hereinafter is referred as Chiussi.

Regarding claims 2, 11, 21, 31 and 41, Maurya and Matthews teach all limitations set forth in the rejection of claims 1, 10, 20, 30 and 40. Maurya and Matthews do not expressly teach that an initial credit value is equal to data capable of being sent over the link in the set period of time.

Chiussi teaches an initial credit value is equal to data capable of being sent over the link in the set period of time (see col. 2, lines 33-44, ***the bandwidth of inverse multiplexed Network Connections is partitioned among a plurality of switching paths using weight values to determine the fraction of bandwidth to be allocated to each switching path***).

At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to employ determining a weight value proportionate to a fractional of a bandwidth of a path to arrive the invention of claims 2, 11, 21, 31 and 41.

One of ordinary skill in the art would have been motivated to do this in order to improve network performance.

Regarding claims 10, 20, 30 and 49, Maurya teaches a Technique For Transmitting Incoming Multi-Link Point-To-Point (PPP) Packet Traffic Over Multiple Outgoing Links In A Multi-Link Bundle. Maurya teaches a method, a machine-readable storage with executable instructions or an apparatus, comprising:

transmitting the data frame across the link (Fig. 6A, see col. 12, lines 17-21, ***client PC 610 can send segment s of a PP frame across any one of the multi-link in a bundle 630***).

Maurya does not expressly teach:

a) determining a rating of a link in a multilink data connection based on an amount of data that can be transmitted across the link in a set period of time.

b) assigning an initial credit value to the link based on the rating;

c) producing a current credit value by reducing the initial credit value proportionate to an amount of data currently being transmitted on the link;

d) assigning a data frame to be transmitted across the link based on the current credit value;

e) reducing the current credit value after a data frame fragment is sent across the link; and

f) resetting the current credit value to the initial credit value.

Matthews teaches b) assigning an initial credit value to the link (step 16, Fig. 2A, see col. 4, lines 44-49, ***a metric Z value is assigned to each individual link based on transmission criteria***);

c) producing a current credit value proportionate to an amount of data currently being transmitted on the link (steps 22 and 24, Fig. 2A, see col. 4, lines 61-65, ***the metric Z value of the current path is updated to reflect the incremented usage count***);

d) (step 20, Fig. 2A, see col. 4, lines 57-61).

e) updating the current credit value after a data frame fragment is sent across the link (steps 22 and 24, Fig. 2A).

f) resetting the current credit value to the initial credit value (step 30, Fig. 2B, see col. 5, lines 24-29, ***the path's metric Z value is updated in order to reflect the decrease in usage of the path and the path is released***).

At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to employ Matthews' invention with Maurya's invention to arrive the inventions of claims 10, 20, 30 and 49.

One of ordinary skill in the art would have been motivated to do this in order to improve network efficiency (see col. 3, lines 36-45).

Matthews does not explicitly teach reducing the credit value after a data frame fragment is sent across the link.

Matthews does teach a data frame is sent over the link with the credit value (***metric Z value***) that is lowest with highest available bandwidth and increase the metric Z value as

bandwidth is used (see col. 4, lines 50-57) similar to applicant's invention as selecting the link with the largest credit value and reducing the credit value as bandwidth is use. In both inventions, they are designed to determine the current available bandwidth of a link.

At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to modify Matthews' invention from selecting the link with the largest credit values as design choices.

One of ordinary skill in the art would have been motivated to do this in order to improve network efficiency (see col. 3, lines 36-45).

Maurya and Matthews do not expressly teach a) determining a rating of a link in a multilink data connection based on an amount of data that can be transmitted across the link in a set period of time.

Chiussi teaches determining a rating of a link in a multilink data connection based on an amount of data that can be transmitted across the link in a set period of time (see col. 2, lines 33-44, ***the bandwidth of inverse multiplexed Network Connections is partitioned among a plurality of switching paths using weight values to determine the fraction of bandwidth to be allocated to each switching path***).

At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to employ determining a weight value proportionate to a fractional of a bandwidth of a path.

One of ordinary skill in the art would have been motivated to do this in order to improve network performance.

Regarding claims 3, 13, 23, 24, 33, 34 and 42, Maurya, Matthews and Chiussi teach all limitations set forth in the rejections of claims 2, 10, 20, 30 and 41. Matthews further teaches a current credit value is equal to the initial credit value minus data currently being transmitted (steps 22 and 24, Fig. 2A, see col. 4, lines 61-65, ***the metric Z value of the current path is updated to reflect the incremented usage count***).

Matthews does not expressly teach including reducing the current credit value (with high initial credit value) after a data frame fragment is sent across the link.

Matthews does teach increasing the current credit value (***with low initial metric Z value***) after sending a data frame fragment across the link (steps 22 and 24, Fig. 2A, see col. 4, lines 61-65, ***the metric Z value of the current path is updated to reflect the incremented usage count***) similar to applicant's invention as reducing the credit value as bandwidth is used.

At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to modify Matthews' invention from reducing the link with the largest credit values as design choices.

One of ordinary skill in the art would have been motivated to do this in order to improve network efficiency (see col. 3, lines 36-45).

Regarding claims 4, 15, 25, 35 and 43, Maurya, Matthews and Chiussi teach all limitations set forth in the rejections of claims 3, 10, 20, 30 and 42. Matthews further teaches the current credit value is reset to the initial credit value originally given (step 30, Fig. 2B, see col. 5,

lines 24-29, ***the path's metric Z value is updated in order to reflect the decrease in usage of the path and the path is released***).

Regarding claims 5, 16, 26, 36 and 44, Maurya, Matthews and Chiussi teach all limitations set forth in the rejections of claims 4, 15, 25, 35 and 43. Matthews further teaches reset occurs when all the links have a current credit value of zero (see col. 9, lines 22-33, ***when bandwidth in a link/path has been used, it is logically to reset the metric Z value to zero to avoid traffic congestion/bottleneck on that link***).

Regarding claims 6, 17, 27, 37 and 45, Maurya, Matthews and Chiussi teach all limitations set forth in the rejections of claims 4, 15, 25, 35 and 44. Matthews further teaches reset occurs when a link has a negative current credit value (see col. 9, lines 22-33).

Regarding claims 7, 18, 28, 38 and 46, Maurya, Matthews and Chiussi teach all limitations set forth in the rejections of claims 4, 15, 25, 35 and 43. Chiussi further teaches reset occurs when a preset time period has passed (see col. 13, line 65 – col. 14, line 2, ***when a queue remains empty for a period longer than the time-out, it is set to the IDLE state and all the non-empty queues are set to the FLUSH state, in order to attempt a re-alignment at the next frame boundary***).

Regarding claims 8, 19, 29, 39 and 47, Maurya, Matthews and Chiussi teach all limitations set forth in the rejections of claims 3, 10, 20, 30 and 42.

Matthews does not expressly teach if two links have the same current credit value, a data frame is sent over the link that has a slower speed of data transmission.

Matthews does teach that if two links have the same current credit (***the same metric Z values***) then the path with highest bandwidth is selected (see col. 8, lines 21-30).

At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to modify Matthews' invention from selecting the link with the higher bandwidth to selecting the link with the lower bandwidth with the same metric Z values as design choices.

One of ordinary skill in the art would have been motivated to do this in order to improve network efficiency (see col. 3, lines 36-45).

Conclusion

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Bertin et al. (US 5,687,167); Beshai (US 6,356,546); Malik (US 6,496,504); Hunter et al. (US 6,731,599); Blair (US 6,778,495) are cited to show Load Balancing Model For Multilink Frame Relay.

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lee Khuong whose telephone number is 571-272-3157. The examiner can normally be reached on 9AM - 5PM.

7. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Huy Vu can be reached on 571-272-3155. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

8. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Lee T. Khuong
Examiner
Art Unit 2665

ALPUS H. HSU
PRIMARY EXAMINER